NPIC/TSSG/RED-074-70
17 March 1970

MEMORANDUM FOR: Chief, Technical Services & Support Group, NPIC

THROUGH : Chief, Research & Engineering Division, TSSG

SUBJECT : IEG Imagery Identification Keys

1. TSSG has been requested by IEG to explore the problems surrounding the production of a new Imagery Identification Key that has been developed by IEG. This key, though found to be helpful in training new photo interpreters, has also proven to be very expensive to produce. Additionally, as word of the key leaked into the community, NPIC began receiving requests for copies from other organizations. With the possibility of the production of a large number of keys becoming likely, TSSG was directed to investigate various methods of producing the keys at a reasonable cost, either through introduction of new processes, modification of in-house equipment, purchase of off-the-shelf items, or modification of reproduction techniques and equipment.

2. The initial step was to establish contact with various Department of Defense units to see if anything they have in the line of equipment could fill the bill. A personal visit was made to NRTSC in Suitland, and written communication has been established with RADC. NRTSC was very interested in what we have developed but had nothing that would meet either the resolution requirements of our system imagery or the format specifications. I am currently awaiting a reply from RADC. [redacted] the contact at RADC, did not offer much encouragement. 25X1

3. The second phase of the project was to evaluate the steps in the production of each of the keys. IEG sends a rough draft of the key to the Visual Presentations Branch/PSG, where a paste-up is made for the printed copy. Current estimates are one day to produce the paste-up itself, with an additional day required if a line drawing is to be included. The paste-up is then sent to the Photo Lab where a 1:1 line negative is made. This step of the procedure would remain the same no matter what the final receptor material will be. Any improvement in this process would have to result from general improvements in the equipment utilized by the Visual Presentations Branch. The Photo Lab step for the line negative is a fixed routine. The negative is simply attached to a pin register sheet for the final printing.

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4. The second portion of the card is made up of a continuous tone collateral photograph. At present, a print is made in the size desired for the final reproduction, and a new negative is shot at a ratio of 1:1. This negative is also mounted on a pin register sheet, and it, together with the line negative, composes the photography that, at present, is printed onto the card.

5. The third and final segment of each key consists of a stereo pair of the latest imagery we have from the system materials. At present, the pair is being printed on transparency film and mounted by hand behind a pair of holes which have been previously cut by hand in the card.

6. The study which has been conducted for this report resulted in suggested modifications in technique and changes in materials to reduce the current cost estimates.

7. Non-conventional materials such as Dry Silver, Diazo, Dry Diazo, and Kalvar were actively considered and a couple sent for evaluation by IEG. Unfortunately, none of those evaluated could meet the quality requirements that must be fulfilled for the keys to do their job. Additionally, our Lab is not currently familiar enough with any of these materials to allow them to presently obtain the full range of reproduction we need.

8. Future editions of these keys will be a very appropriate vehicle for introducing non-conventional materials into the Center, but at the present time, these materials will not stand up in a stringent cost analysis even though the raw material might be less expensive. In addition, changes in the final material would not reduce the steps or time required by PSG in producing the paste-up and line negative.

9. The main change in technique that is recommended is the printing of the stereo pairs directly onto the piece of material that makes up the body of the key. This procedure was chosen for the following reasons:

a. Elimination of the need to cut numerous pairs of holes for the stereo pairs (a die press to do the job was estimated at [redacted] 25X1

b. Elimination of the need for a separate printing step to produce the stereo transparencies.

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10. [redacted] Chronopaque has been selected for recommendation because it is a material with which the Photo Lab is completely familiar. The NPIC Lab has produced numerous prints on Chronopaque and knows the characteristics and idiosyncrasies of the material. The one telling advantage that Chronopaque has over photographic paper is that a transparency may be printed directly on the material.

11. The most obvious area for obtaining significant cost reduction could be in the elimination of the separate exposure needed to produce the stereo pair and the time required to mount these images on the key. Chronopaque, a white plastic material, was selected as a possible printing medium and has been evaluated by IEG. The Chronopaque positive has been evaluated and found entirely satisfactory for this purpose. This material has characteristics that allow it to be used in both a reflection and transillumination mode. For this reason, the textual and collateral material may be viewed as reflection prints (opaque) while the stereo pair may be viewed as transparencies.

12. In addition to the use of non-conventional photographic materials, the possibility of an equipment development program was considered. When it was concretly determined that the maximum current production ceiling was in the vicinity of 500 originals with eight copies of each and yearly updates of no more than 300 finished keys, equipment development consideration was discontinued. It is felt to be impractical to develop an expensive, limited capability printer for such a small quantity of work. If, for example, we are tasked to produce 300 copies of 200 different keys, then it will be worthwhile to investigate the possibilities of having a production step and repeat printer modified or other development programs begun.

13. The following revised production procedure is recommended:

a. Produce a paste-up of the printed material for each of the keys.

b. Produce a black and white print of the collateral photography and mount same on the paste-up.

c. Shoot a continuous tone negative of the modified past-up.

d. Send the negative to IEG along with the negatives for the stereo pair.

e. Have a photo interpreter mount the stereo negatives in the appropriate positions on the paste-up negative.

f. Return the negative to PSG to produce the required number of Chronopaque positives.

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14. It is felt that the above tentative procedure, though eliminating one entire copy camera operation, should produce keys of sufficiently high quality to satisfy all requirements.

15. If utmost quality is required, for a somewhat higher cost, two negatives could be produced. One would consist only of line imagery while the other would be made up of collateral imagery and the mounted stereo pair. This would give the photo lab somewhat more latitude, but at a much higher cost.

16. No contact was made with the cleared processor as the volume of work at the present time does not appear sufficient to require outside help. In addition, the processor could only assist in the actual lab work, whereas the major expenses are incurred in making the paste-up for the negatives and the shooting of same.

17. In conclusion, the following recommendations are made:

a. Print the entire key on one piece of Chronopaque material, 7 mil thick.

b. To obtain minimum cost, use only a single negative with the stereo pair negatives mounted thereon.

c. For applications requiring higher quality but at increased cost, employ two negatives, one for continuous tone imagery and the other for line material.

[redacted]
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Distribution:
Original - Addressee
1 - C/IEG
1 - C/PSG
1 - NPIC/IEG (Attn: [redacted])
1 - C/PSG/RD
1 - C/PSG/RD/PB
1 - C/PSG/RD/VPB

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NPIC/TSSG/RED [redacted] 3 March 1970

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